

Chapter 9 – Schedule

The implementation schedule for all Vital Signs was presented in Chapter 5. In this chapter we present the seasonal sampling periods and annual revisit rates for each park for the first ten protocols we intend to implement in 2006 and 2007. Data collection will occur primarily during the snow-free months of April through October, although climate and air quality data will be acquired throughout the year (Table 9.1). Schedules are closely tied to the monitoring questions and biology of the resources being monitored; however, within-year schedules also depend on access and other logistical constraints.

SEASONAL PHENOLOGY

In some cases, the timing of monitoring will depend on phenological differences among parks. Spring comes earlier and summers are longer in the more southerly parks, such as INDU and MISS. Thus, we will begin calling surveys for amphibians in southern parks and move north. Similarly, vegetation monitoring will need to be scheduled in each park to ensure spring green-up has occurred so that ground flora can be found and identified. Conversely, winter comes early and stays longer in northern parks and schedules will have to account for the relatively shorter field season. Parks that are on the Great Lakes generally have moderated weather patterns which can retard spring green-up and dampen extremes in summer heat and winter cold. Several parks receive lake effect precipitation, which may also affect the timing of some monitoring activities.

SCHEDULED TRAINING

Each protocol will have a standard operating procedure for any training or certification requirements. Some training will occur days, or even weeks, before the field season begins, while other training will occur during the initial days of field work. Training and certification for identifying landbirds will be accomplished through a web site being co-developed with the Wisconsin Department of Natural Resources for identifying birds is being developed to help make monitoring more consistent and to document observer abilities. However, training for terrestrial vegetation will be scheduled differently. In this case, most of the training will be incorporated into the initial days of monitoring with an experienced field botanist.

Field work that requires crew members to operate water craft will require boat training and certification. We will normally get logistical support from the park or take public transportation at APIS, SLBE, and ISRO where large boats are required to navigate the Great Lakes. However, to reduce dependence on park staff, we will be trained and certified to use small boats (16' to 20') and/or canoes on inland lakes and rivers. This training will be scheduled prior to the field season at one of the nearest parks.

Table 9.1. Generalized seasonal schedule for collecting monitoring data for each of the initial ten protocols planned for implementation in the Great Lakes Inventory and Monitoring Network parks in 2006 and 2007. A “T” in a cell denotes timing of training for staff. Specific dates can be found in individual protocols and SOPs.

Protocol	Sample type	January	February	March	April	May	June	July	August	September	October	November	December
Climate	Acquisition/upload												
Air quality	Acquisition/upload												
Land birds	Point counts					T							
Bioaccumulative contaminants	Bald eagle tissue												
	Herring gull eggs												
Water quality for large rivers	Chemistry and flow		T										
Water quality for inland lakes	Chemistry and			T									
Amphibians	Calling surveys				T								
	Daytime searches				T								
Terrestrial vegetation and soils	Composition and structure					T							
	Deer browse					T							
Land cover/land use (coarse and fine scale)	Aerial flights												

SCHEDULING WITH PARK STAFF

Access to certain parks is greatly limited by the size and associated dangers of traveling by boat on the Great Lakes. In particular, APIS, ISRO, and to a lesser degree, SLBE pose a challenge in getting to and from sampling sites. For access to these parks we have purchased a 21 foot twin engine boat and will need to either hire a part time boat operator, use park staff who are certified operators, or get Network staff certified as operators. For smaller craft we will schedule boat transportation with park staff or find public transportation such as ferries. To ensure our logistical needs are understood and the parks have ample opportunity to fit our program into their work load, we will send out a “Preliminary Monitoring Schedule and Request for Support” letter to each park in late February every year. This notice and request for assistance will give each park our best estimates of dates, number of observers, and needs for transportation, housing, and other facilities required for the year. A second “Final Monitoring Schedule and Support Needs” letter will be sent in April each year to provide final estimates and additional detail such as the specific location of sites to be visited. These preliminary and final requests should allow parks adequate time for scheduling and assessing whether our needs can indeed be met. It will also limit the number of contacts each park must have regarding scheduling events with Network staff.

PARK-SPECIFIC SAMPLING

Revisit schedules are covered more thoroughly in Chapter 4 and in each protocol; however, it is worth noting here that in addition to the statistical rationale behind revisit designs for each protocol, we have attempted to spread annual sampling among the parks (Table 9.2). Reasons for dispersing sampling effort among parks include: 1) it reduces the chance of overloading a single park’s ability to meet our transportation and facility

requests, 2) it increases park support for our program when some monitoring occurs in their park each year, 3) in some cases it allows us to take advantage of park proximity to reduce travel costs, and 4) it was necessary to mix logistically challenging (and thus costly) parks with those that are more accessible to stay within budget. In the initial two years, the Network will be conducting field work (excluding data acquisition for air and weather) in connection with as many as six protocols in each park (Table 9.2).

The rotation, or revisit rate, for each protocol across the six planning years can be seen more clearly in Table 9.3. The revisit schedule is a balance between the cost of sampling and the need for repeated visits to provide statistical rigor (see Chapter 4). We are attempting to coordinate terrestrial vegetation monitoring on the ground with remote sensing efforts for the land cover/ land use monitoring (Tables 9.2 and 9.3). However, data collection for the land cover/ land use protocol will likely consist of aerial photography flights in both fall and spring, which is a major expense. We may choose to utilize other available photography, often flown by states and other municipalities, when it meets our criteria and if it is within a 1-4 year window around our target year. Thus the occurrence of aerial flights shown on Tables 9.2 and 9.3 is a target year with bounds of 1-4 years.

Table 9.2. Annual occurrence of monitoring (by park) for the first ten protocols, 2006-2011.

2006

Protocol	Sample type	APIS	GRPO	INDU	ISRO	MISS	PIRO	SACN	SLBE	VOYA
Climate	Acquisition/upload	•	•	•	•	•	•	•	•	•
Air quality	Acquisition/upload	•	•	•	•	•	•	•	•	•
Land birds	Point counts	•	•	•	•	•	•	•	•	•
Bioaccumulative contaminants	Bald eagles	X			X ¹	X	X ¹	X	X ¹	X ¹
	Herring gulls	X			X ¹				X ¹	X
Water quality (lakes or rivers)	Core and advanced			X		X				X
Amphibians	Calling surveys	X					X ²		X	
	Daytime searches	X					X ²		X	
Terrestrial vegetation and soils	Composition and structure									
	Deer browse									
Land cover/land use	Aerial flights									

2007

Protocol	Sample type	APIS	GRPO	INDU	ISRO	MISS	PIRO	SACN	SLBE	VOYA
Climate	Acquisition/upload	•	•	•	•	•	•	•	•	•
Air quality	Acquisition/upload	•	•	•	•	•	•	•	•	•
Land birds	Point counts	•	•	•	•	•	•	•	•	•
Bioaccumulative contaminants	Bald eagles	X			X ¹	X	X ¹	X	X ¹	X ¹
	Herring gulls	X			X ¹				X ¹	X
Water quality (lakes or rivers)	Core and advanced	X		X	X		X	X	X	X
Amphibians	Calling surveys	X ²			X	X			X	
	Daytime searches	X ²			X	X			X	
Terrestrial vegetation	Composition and structure		X	X				X		
	Deer browse		X	X				X		
Land cover/land use	Aerial flights		X	X				X		

2008

Protocol	Sample type	APIS	GRPO	INDU	ISRO	MISS	PIRO	SACN	SLBE	VOYA
Climate	Acquisition/upload	•	•	•	•	•	•	•	•	•
Air quality	Acquisition/upload	•	•	•	•	•	•	•	•	•
Land birds	Point counts	•	•	•	•	•	•	•	•	•
Bioaccumulative contaminants	Bald eagles						X ¹		X ¹	X ¹
	Herring gulls				X ¹				X ¹	
	Species TBD		X	X						
Water quality (lakes or rivers)	Core and advanced	X	X	X	X	X	X		X	X
Amphibians	Calling surveys		X	X			X	X		
	Daytime searches			X				X		X
Terrestrial vegetation	Composition and structure									X
	Deer browse									X
Land cover/land use	Aerial flights									X

Table 9.2. Continued.

2009

Protocol	Sample type	APIS	GRPO	INDU	ISRO	MISS	PIRO	SACN	SLBE	VOYA
Climate	Acquisition/upload	•	•	•	•	•	•	•	•	•
Air quality	Acquisition/upload	•	•	•	•	•	•	•	•	•
Land birds	Point counts	•	•	•	•	•	•	•	•	•
Bioaccumulative contaminants	Bald eagles						X ¹		X ¹	X ¹
	Herring gulls				X ¹				X ¹	
	Species TBD		X	X						
Water quality (lakes or rivers)	Core and advanced	X	X	X	X		X	X	X	X
Amphibians	Calling surveys				X	X			X	
	Daytime searches	X			X	X				
Terrestrial vegetation	Composition and structure				X					
	Deer browse				X					
Land cover/land use	Aerial flights				X					

2010

Protocol	Sample type	APIS	GRPO	INDU	ISRO	MISS	PIRO	SACN	SLBE	VOYA
Climate	Acquisition/upload	•	•	•	•	•	•	•	•	•
Air quality	Acquisition/upload	•	•	•	•	•	•	•	•	•
Land birds	Point counts	•	•	•	•	•	•	•	•	•
Bioaccumulative contaminants	Bald eagles	X			X ¹	X	X ¹	X	X ¹	X ¹
	Herring gulls	X			X ¹				X ¹	X
	Species TBD									
Water quality (lakes or rivers)	Core and advanced	X	X	X	X	X	X		X	X
Amphibians	Calling surveys		X	X			X	X		
	Daytime searches			X				X		X
Terrestrial vegetation	Composition and structure						X		X	
	Deer browse						X		X	
Land cover/land use	Aerial flights						X		X	

2011

Protocol	Sample type	APIS	GRPO	INDU	ISRO	MISS	PIRO	SACN	SLBE	VOYA
Climate	Acquisition/upload	•	•	•	•	•	•	•	•	•
Air quality	Acquisition/upload	•	•	•	•	•	•	•	•	•
Land birds	Point counts	•	•	•	•	•	•	•	•	•
Bioaccumulative contaminants	Bald eagles	X			X ¹	X	X ¹	X	X ¹	X ¹
	Herring gulls	X			X ¹				X ¹	X
	Species TBD		X	X						
Water quality (lakes or rivers)	Core and advanced	X	X	X	X		X	X	X	X
Amphibians	Calling surveys				X	X			X	
	Daytime searches	X			X	X				
Terrestrial vegetation	Composition and structure	X				X				
	Deer browse	X				X				
Land cover/land use	Aerial flights	X				X				

¹ = Collaborative effort with Clemson University and Michigan Department of Environmental Quality

² = Collaborative effort with the Great Lakes National Program Office

X = Protocol developed, implemented, and reporting is solely by the Network.

• = The Network is collaborating with parks and others who are collecting the data; the Network will develop protocols to increase consistency, and to document methods of acquiring the data; the Network will report on the data.

Table 9.3. Revisit schedule for ten initial protocols that will be implemented by the Great Lakes Inventory and Monitoring Network - 2006 through 2011. x = initial year(s) of implementation; some change likely. **X** = full implementation expected.

Protocol	Park	2006	2007	2008	2009	2010	2011
Climate	All	x	X	X	X	X	X
Air Quality	All			X	X	X	X
Landbirds	VOYA	x	X	X	X	X	X
	GRPO	x	X	X	X	X	X
	ISRO	x	X	X	X	X	X
	APIS	x	X	X	X	X	X
	PIRO			X	X	X	X
	SLBE	x	X	X	X	X	X
	SACN	x	X	X	X	X	X
	MISS	x	X	X	X	X	X
Bioaccumulative Contaminants	INDU	x	X	X	X	X	X
	VOYA	x	X	X	X	X	X
	PIRO	x	X	X	X	X	X
	SLBE	x	X	X	X	X	X
	ISRO	x	X			X	X
	APIS	x	X			X	X
	SACN	x	X			X	X
	MISS						
Water Quality for Large Rivers	GRPO			x	X		
	INDU			x	X		
	MISS	x		X		X	
Water Quality for Inland Lakes	SACN		x		X		X
	VOYA	x	X	X	X	X	X
	INDU	x	X	X	X	X	X
	APIS		x	X	X	X	X
	SLBE		x	X	X	X	X
	ISRO		x	X	X	X	X
Amphibians	PIRO		X	X	X	X	X
	APIS	x	x		X		X
	GRPO			X		X	
	VOYA			X		X	
	MISS		x		X		X
	INDU			X		X	
	ISRO		x		X		X
	SACN			X		X	
Terrestrial Vegetation	SLBE	x	x		X		X
	SACN		x				
	INDU		x				
	GRPO		x				
	VOYA			X			
	ISRO				X		
	SLBE					X	
	PIRO					X	
Land Cover/Land Use (both coarse and fine scale)	MISS						X
	APIS						X
	SACN		x				
	INDU		x				
	GRPO		x				
	VOYA			X			
	ISRO				X		
	SLBE					X	
	PIRO					X	
	MISS	**					X
	APIS						X

** = The Network will fund work in 2006 that reflects land cover/land use in 2003